

Listing of the Claims

The following listing of the claims is intended to replace prior versions, listings, or recitations of the claims in the present application.

Claim 1 (Currently Amended): A method of cleaning semiconductor wafers before the epitaxial deposition step comprising: (A) etching silicon wafers with HF solution; (B) rinsing the etched wafers with ultrapure ozonated water; (C) treating the rinsed wafers with dilute SC1 solution; (D) rinsing the treated wafers; (E) treating the wafers with dilute HF solution; (F) rinsing the wafers with DI water; (G) drying the wafers with nitrogen and a trace amount of IPA; wherein steps (E) through (G) are conducted in a single dryer chamber and wafers are not removed from the chamber between steps.

Claim 2 (Original): Method of claim 1 wherein the dried wafers are subsequently treated in an epitaxial reactor and baked at a temperature of 700° F or below.

Claim 3 (Currently Amended): Method of claim 1 wherein the HF solution in step (A) is a solution of 0.5 to 5% by weight HF in water.

Claim 4 (Currently Amended): Method of claim 1 wherein the dilute HF solution in step (E) is a solution of 0.05 to 0.25% by weight HF in water.

Claim 5 (Currently Amended): Method of claim 1 wherein the dilute SC1 solution is a solution of 0.1 to 0.5% by weight ammonium hydroxide and about 0.1 to 1 % by weight hydrogen peroxide in water.

Claim 6 (Original): Method of claim 1 wherein the ozonated water in the rinse of step (B) comprises less than about 10 parts per million (ppm) ozone in water.

Claim 7 (Original): Method of claim 1 wherein the dissolved oxygen (DO2) is controlled at less than 1 part per billion (ppb) in water.

Claim 8 (Original): Method of claim 1 wherein ~~the~~ total organic carbon (TOC) is less than about 1 ppb in water.

Claim 9 (Original) Method of claim 1 wherein ~~the~~ total dissolved silica is less than about 1 ppb in water.

Claim 10 (Withdrawn): Apparatus for pre-epitaxial cleaning of silicon wafers comprising a single tank adapted for cleaning, rinsing, and drying the wafers, the apparatus comprising means to inject HF into a DI water stream.

Claim 11 (Withdrawn): Apparatus of claim 10 wherein the tank is constructed of primarily fluoropolymer material.

Claim 12 (Withdrawn): Apparatus of claim 11 wherein the fluoropolymer is PVDF or PFA.

Claim 13 (Withdrawn): Apparatus of claim 10 wherein the means to inject HF comprises a metering pump, a reservoir, a static mixer, and a processor to control the concentration and flow of HF into the tank.

Claim 14 (Withdrawn): Apparatus of claim 10 wherein an outer weir directs cascading liquid into the module drain.

Claim 15 (Withdrawn): Apparatus of claim 10 wherein the tank has a profile that provides the optimum fluid flow field for uniform etching of dielectric films.